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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,164	03/27/2001	Brian R. Stoner	032566-010	8176

7590 06/05/2003

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EXAMINER
GUHARAY, KARABI

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/817,164	STONER ET AL.	
	Examiner	Art Unit	
	Karabi Guharay	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *11* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Amendment C, filed on January 9, 2003 has been considered and entered.

IDS (paper # 11) filed on January 9, 2003 has been considered and signed.

Amendments of specification overcome the objection to the disclosure.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the elements "interface device box' and 'central office switching gear" as claimed in claim 34, and 36, and "asymmetric digital subscriber line" as claimed in claim 37, as well as "high bit rate digital subscriber line" claimed in claim 38, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5-8, 10-11, 22, 43, 52-53, 55, 59, are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu (US 6448701).

Regarding claims 1, 52 & 59, Hsu discloses an electrode (see Fig 2) comprising a first electrode material (conductive substrate 102 of Fig 1f, or 302 of Fig 3b, line 12-13 of column 5) an adhesion-promoting layer (catalyst layer 104, and 304 of Fig 1f and 3b respectively) disposed on at least one surface of the first electrode (102), and a nano-structure containing material comprising at least one of nano-tube and nan-orod (114 of Fig 1F, or 314 of Fig 3b, lines 7-9 of column 6) disposed on a portion of the adhesion promoting layer (104, or 304). Recitation of "pre-formed nano-structure" simply recites the method of forming nano-structure, however, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Regarding claims 5-7, Hsu discloses that the adhesion-promoting layer (104) comprises metallic material, tungsten, which is a carbide forming material.

Regarding claims 8 & 53, Hsu discloses that nano-structure containing material is a carbon nano-tube.

Regarding claim 10, Hsu discloses that nano-structure containing material is formed from carbon or silicon or germanium (lines 15-20 of column 7).

Regarding claims 11, 22, 43 and 55, Hsu disclosed that the electrode is annealed (line 62-64 of column 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 12-21, 23-26, 39-42, 45-54, 56-59, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gartner et al. (US 5866975).

Regarding claims 1, 8, 52-53, 59, Gartner discloses an electrode (see Fig 2) comprising a first electrode (22), an adhesion-promoting layer (24) disposed on at least one surface of the first electrode (22), and a nano-structure containing material (26) disposed on a portion of the adhesion promoting layer (22). See lines 66 of column 5-17 of column 6. However, Gartner is silent as to whether the nano-structure containing material is at least one of nanotube and nanorod. It is well known in the art (as disclosed by applicant) that examples of nano-structure containing materials are nano-particles, cage like fullerene, nano-tubes, silicon nano-rods nano-wires. It is noted that applicant's specific choice of nanotube or nanorod does not solve any of the stated problems or yield any unexpected result that is not within the scope of the teachings

applied. Therefore it is considered to be a matter of choice, which a person of ordinary skill in the art would have found obvious to select one of the nanostructure containing materials such as nanotube or nanorod.

Recitation of "pre-formed nanostructure" simply recites the method of forming nanostructure, however, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Regarding claims 2 & 56, Gartner discloses that the electrode is a gas discharge device electrode (see abstract).

Regarding claims 3, 16, and 51, Gartner meets all the limitations, except for the first electrode material being molybdenum. However, Gartner discloses that the first material is conductive, molybdenum is a well known conductive material for making electrode, thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use molybdenum as the first electrode material in the device of Gartner, since selection of known material on the basis of its suitability for intended use is within the skill of a general worker in the art.

Regarding claims 4, 17 and 50, Gartner meets all the limitations of claims 4, and 17 together with nano-structure containing layer having thickness of approximately 1-100 micron (line 3 of column 4) as claimed in claims 17 and 50, but, fails to disclose the thickness of the adhesion-promoting layer (24). However, it would have been obvious to one having ordinary skill in art at the time of invention to obtain a range of thickness as 1-1000 nm, since it has been held that where the general conditions of a claim are

disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Regarding claims 5 and 7, Gartner discloses that the adhesion promotion layer (24) comprises a metallic material such as Ni, Co, Fe, Si, Mo, Ti, Ta, W, Nb, Zr, Cr, Hf, Al, Sn Cd, Zn, or Bi (lines 3-7 of column 6).

Regarding claims 6 & 58, Gartner discloses that the adhesion promotion layer (24) comprises a carbon-dissolving, carbide forming, or low melting point material (tungsten is a carbide forming material, tungsten carbide).

Regarding claim 9, 21, 40, 45 and 54, Gartner discloses different nano-structure material, instead of claimed single-wall-carbon nanotube. Single walled carbon nanotubes are well known suitable nano-structure in the field of electrode material, thus, thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use single wall carbon nanotube as the first nano-structure material in the device of Gartner, since selection of known material on the basis of its suitability for intended use is within the skill of a general worker in the art.

Regarding claims 12-13, and 23-24, Gartner discloses that the low voltage cathode has turn on voltage for electron emission for greater than 3 microampere is about 7.5V/micron (see Fig 1 and lines 30-42 of column 7), however, it would have been obvious to one having ordinary skill in art at the time of invention to obtain a range of thickness as claimed in claim 12-13 and 23-24, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Regarding claims 14, 25 and 49, Gartner discloses that the nano-structure material covers the entire adhesion promotion layer (24, see Fig 2).

Regarding claims 15, 26, 39, 42, 48 and 57, Gartner discloses that the low pressure cathode of claim 1 (see rejection of claim 1) is used in a electric discharge tube or discharge lamp (see abstract), but does not disclose a sealed chamber containing at least one noble gas and a plurality of spaced electrodes, however, it is intrinsic in any electric discharge tube or discharge lamp.

Claim 18 recites essentially the same limitations of claim 5. Thus claim 18 is rejected as claim 5 (see rejection of claim 5).

Claims 19, 41 and 46, recite essentially the same limitations of claim 6. Thus claim 19 is rejected as claim 6 (see rejection of claim 6).

Claims 20, and 47 recite essentially the same limitations of claim 7. Thus claim 20 is rejected as claim 7 (see rejection of claim 7).

Claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yapoujin (US 4707762), and further in view of Gartner as applied to claim 1.

Regarding claims 27-29, Yapoujian discloses a gas discharge tube having spaced electrodes (20, 22 of Fig 2) having separation distance between 0.1-1.0 mm, where the separation distance is created by a ceramic spacer (30, lines 17-66 of column 3), but fails to disclose electrodes as claimed in claim 1. However, Gartner discloses an electrode as claimed in claim 1 in a gas discharge tube, since such tubes have short switching time as well as energy consumption for the tube is low (lines 37-41 of column 2). Thus it would have been obvious to one having ordinary skill in the art at the time

the invention was made to use electrodes as disclosed by Gartner in the surge protection gas tube of Yapoujian used in telecommunication circuit, since this will improve the switching time of the protection device as well as cost of the device.

Regarding claims 30-31, Yapoujin discloses an inert gas but does not disclose pressure of 0.5-800 torr, and inert gas being argon. However, choosing argon as the inert gas and obtaining a optimum range of the pressure would have been obvious to an ordinary skill in the art, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claims 32-33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debbaut et al. (US 5557250), and further in view of Gartner as applied to claim 1.

Regarding claims 32-33, Debbaut et al. discloses a telecommunication network comprising a gas discharge tube having all the limitations of claims 32-33 (lines 50-62 of column 14), including average breakdown voltage of approximately 448.5V or 400V (lines 5-6 of column 15) except for the electrodes as claimed in claim 1. However, Gartner discloses an electrode as claimed in claim 1 in a gas discharge tube (see rejection of claim 1), since such tubes have short switching time as well as low energy consumption (lines 37-41 of column 2). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use electrodes as disclosed by Gartner in the protection gas tube of Debbaut's telecommunication circuit, since this will improve the switching time of the protection device as well as cost of the device.

Claims 34 and 36 are rejected under 35 U.S.C 103 (a) as being unpatentable over Debbaut et al. (US 5557250), in view of Gartner further in view of Perry et al. (Us 5557672).

Regarding claims 34, and 36, both Debbaut and Gartner meet all the limitations of claim 34 and 36, except for an interface unit and a central switching gear. However, Perry et al. discloses a telecommunication network with central switching gear for switching different channel and an interface unit for digitizing DC and AC signal carried by two-wire transmission path (lines 8-12 and 52-61 of column 4). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate central switching gear in order to control telecommunication and an interface device for digitize DC and AC signal.

Claims 37 and 38 are rejected under 35 U.S.C 103 (a) as being unpatentable over Debbaut et al. (US 5557250), in view of Gartner further in view of Dunn et al. (US 5841836).

Regarding claim 37, and 38, Debbaut and Gartnet meet all the limitations of the claims 37 and 38 except for ADSL and HDSL lines in the telecommunication net work. However, Dunn et al. discloses a telecommunication network with ASDL and HDSL line in order to transfer data to customers. Thus it would have been obvious to one having ordinary skill in theart at the time the invention was made to include ASDL and HDSL line in the telecommunication system of Debbaut for transferring high-speed data to customers.

Claims 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 6448701).

Regarding claim 44, Hsu discloses a step of annealing the coated electrode, while does not exemplify the duration pressure and temperature of annealing process. However, it would have been obvious to one having ordinary skill in the art to experiment and find out the optimum conditions for the controlled variable in the prior art process, since it is considered to be within the general skill of a worker.

Response to Arguments

First of all, applicant's arguments, regarding DRAWING OBJECTIONS, filed on January 09, 2003, have been fully considered but they are not persuasive. Applicant argued that features mentioned are conventional elements do not form a part of presently claimed invention of the unique electrode, thus those are not necessary in the drawing to understand the claimed invention.

In this regard, examiner respectfully points out that 37 C.F.R 1.83(a) states that conventional features disclosed in the description and claims where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box). See Rule 37 C.F.R 1.83(a) in MPEP.

Secondly, applicant argues that claimed nano-structure being formed prior to its application in the electrode, i.e pre-formed, while in the electrode of Hsu, nano-structure is grown *in situ,* consequently two structures are fundamentally different.

In response to that examiner respectfully states that a comparison of the claimed process with the prior art process does not resolve the issue concerning patentability of the product. Mere statement that two structures are fundamentally different is not sufficient. Applicant needs to show evidence how the product is different from prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (703) 305-1971. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K. G

Karabi Guharay
Patent Examiner
Art Unit 2879

ASHOK PATEL
PRIMARY EXAMINER